



Mission Operations & Data Analysis Overview

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Agenda



- **MO&DA Overview (Ralph Gaume)**
- **MO&DA Requirements & System Engineering (Bryan Dorland)**
- **The First 50 Days of FAME (Patricia Klein)**
- **Orbit Design, Navigation, Determination (Jim Barnds, Lisa Policastri)**
- **Mission Operations Center (MOC) (Patricia Klein)**
- **Science Operations Center (SOC) (Bryan Dorland)**
- **Data Analysis & Processing (Tom Codella & George Kaplan)**



Introduction



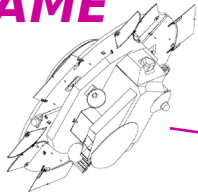
- **FAME Ground Segment Consists of 3 Components:**
 - **Mission Operations Center (MOC) Located at Blossom Point MD (NRL)**
 - **Science Operations Center (SOC) Located at U.S. Naval Observatory, Washington DC (USNO)**
 - **Deep Space Network (NASA) (for Early On-orbit Operations, Emergency Backup for BP)**
- **Operates the FAME S/C on Orbit**
- **Receives and Archives Downlinked S/C Housekeeping and Status Telemetry and Science Data**
- **Monitors and Trends S/C Housekeeping and Status Data**
- **Analyze and Reduce FAME Science Data to Produce Mission Science Deliverables: FAME-A and FAME-B Catalogs Together With Observational Database**



Operations Concept



FAME



Telemetry, Tracking, & Commands

MOC
NRL Blossom Point Ground Station
Blossom Point, MD

Primary RF
Front End



Backup RF
Front End



S/C State of Health Monitoring
& Command File Uplink
24/7
SOH Archive

Launch and
Emergenci
es Only

JPL NOCT



NASA's
Deep
Space
Network

SOC



FAME Science & Mission
Planning Center
USNO, Washington, DC
Science Data Archive

- Command Files
 - Tasking Files
 - Star Catalog Uploads
- T1**
- Housekeeping Telemetry, Ground Station Statistics, Scheduling Info via Streaming TCP Socket Connection
 - State Vector Files, Pushed via FTP
 - Gzipped Mission Data & Housekeeping Telemetry Recording Files, Pushed via FTP
 - S/C Bus SOH Reports
 - Weekly Plan Files



PDR Documents

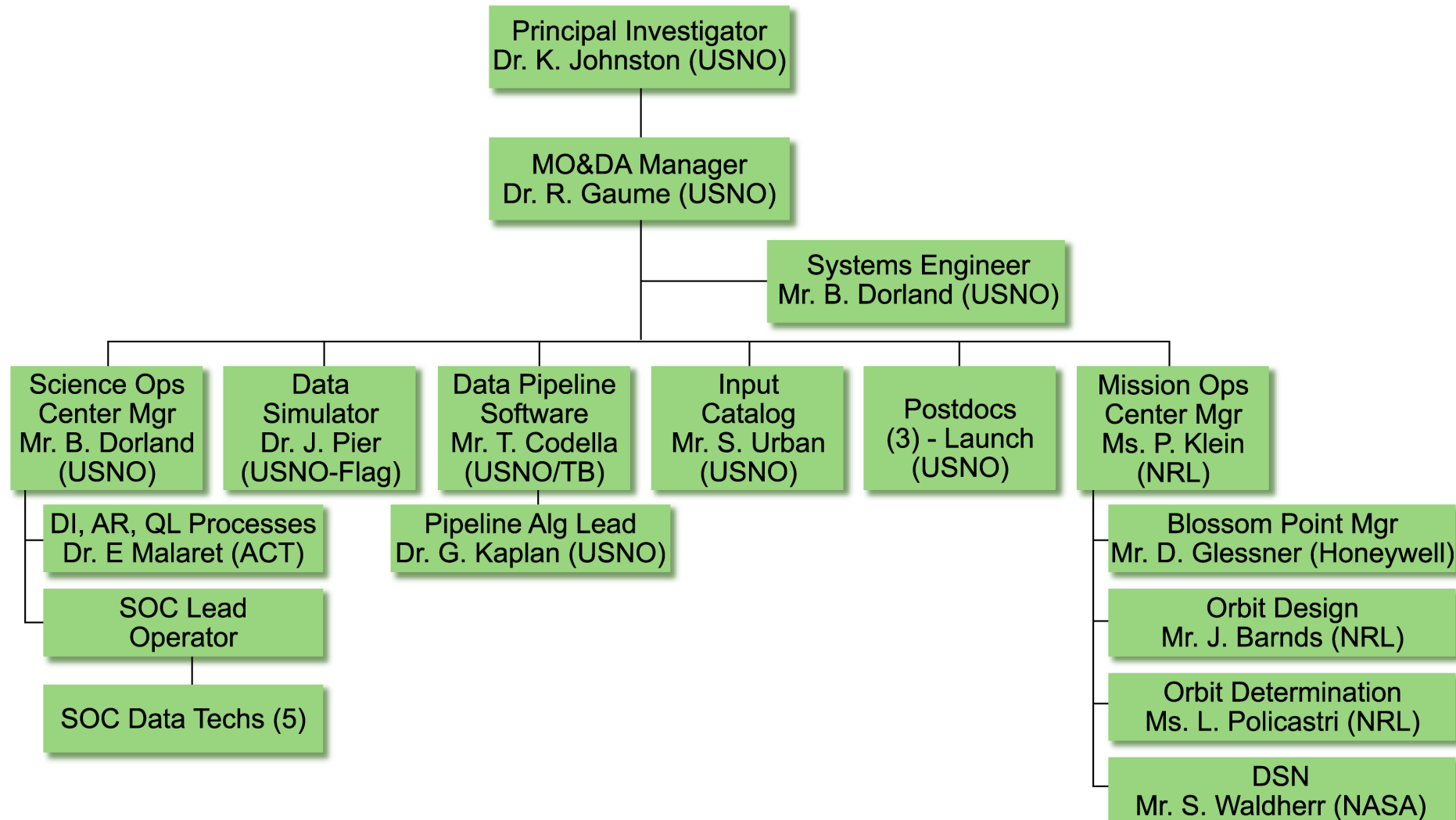


All Documents Released in Preliminary Form; Final Release at CDR

- **Ground Segment Description Document (NCST-D-FM016)**
- **Space to Ground ICD (NCST-ICD-FM003)**
- **Ground Software Development Plan (NCST-SDP-FM002)**
- **Ground Software Requirements Document (NCST-SRS-FM002)**
- **SOC Data Analysis System Requirements (USNO-FM001)**
- **SOC Concept of Operations (USNO-FM002)**
- **SOC Software Development Plan (USNO-FM003)**
- **SOC Software Design (USNO-FM004)**
- **MOC/SOC ICD (USNO-FM005)**
- **FAME Data Analysis Plan (USNO-FM006)**



MO&DA Org. Chart



mgmt_structure_phaseE.ai



MO&DA Salient Features



- **FAME Data Not Immediately Useful for Most Key Science: Must Wait for Observations to Accumulate**
- **Two Public Catalog Releases: FAME-A Catalog (Launch + 3.5 Yr), FAME-B Catalog (Launch+6 Yr)**
- **FAME Is a “Pointed” Mission Requiring an Input Catalog (Observations On-Going)**
- **SOC Consists of Several Systems**
 - **Data Ingestion (DI) (Sci Ops Critical) (ACT Prototype)**
 - **Data Archive (AR) (Sci Ops Critical) “ “**
 - **Quick Look (QL) (Sci Ops Critical) “ “**
 - **Science Data Processing (SDP) USNO-DC, USNO-Flagstaff**
 - **Data Analysis Trending (TR) USNO-DC, USNO-Flagstaff**
 - **Data Layer (DL) USNO-DC**
 - **Data Simulator (DS) USNO-Flagstaff**
 - **Telemetry Display (TD) NRL**
 - **Operations (OP) USNO-DC**
- **FAME Algorithms Are the Core of MO&DA: Risk Is Medium wrt Development Schedule**
- **Data Throughput/Storage: Risk Is Low, Procurement of Pipeline Testbed Hardware Is in Progress. DI, AR, QL Prototype Is Nearly Complete**
- **MOC Is Built on Previous Experience (Blossom Point Tracking Facility)**



MO&DA Top Level Timeline

